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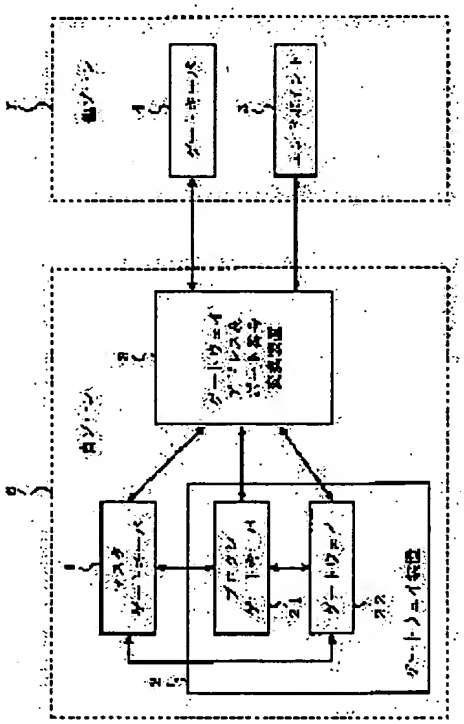
(54) GATEWAY SYSTEM

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a gateway system adopting the functional distribution of an H.323 gatekeeper where one gatekeeper contains many more gateways by distributing the gatekeeper functions and part of the distributed functions is mounted on the gateway device.
SOLUTION: A gateway device 2 is provided with a proxy gatekeeper 21 and a gateway 22. An H.323 zone 6 consists of a master gatekeeper 1 and the gateway device 2, and the communication with a gatekeeper 4 and an end point 5 of another zone 7 is made through a network address and port number converter 3. Functions of an H.323 gatekeeper are distributed into the master gatekeeper 1 and the proxy gatekeeper 21.



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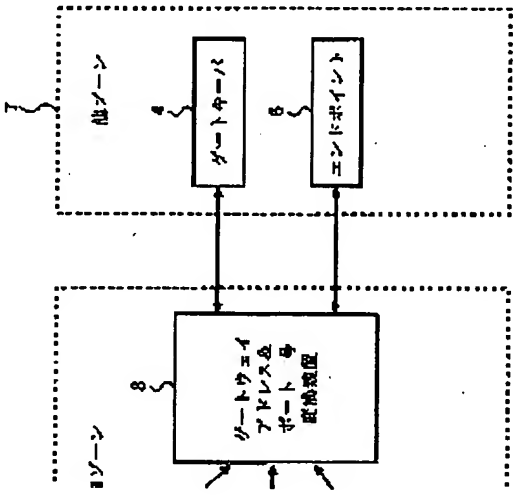
(54)【発明の名称】　ゲートウェイシステム

(57)【要約】
【課題】　ゲートキーパ機能を分割し、一部をゲートウェイ装置に実装することで、より多くのゲートウェイを1つのゲートキーパに収容することができるH.323ゲートキーパ機能分割によるゲートウェイシステムを提供する。
【解決手段】　ゲートウェイ装置２は、プロクシゲートキーパ２１とゲートウェイ２２とを備えている。マスタゲートキーパ１とゲートウェイ装置２とで、H.323ゾーン６を構成し、他のゾーン７のゲートキーパ４やエンドポイント５との通信はネットワークアドレス&ポート番号変換装置３を経由して行う。H.323ゲートキーパの機



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【特許請求の範囲】

【請求項１】H.323を用いた通信システムにて、他のゾーンとの通信のアドレス変換機能、ゾーン管理機能および呼制御シグナリング機能を含むゲートウェイ制御機能を有するマスタゲートキーパと、

このマスタゲートキーパのゲートウェイ制御機能のうちアドレス変換機能およびゾーン管理機能を有するプロクシゲートキーパと、

他のゾーンとの通信のプロトコル変換をするゲートウェイとを具備することを特徴とするゲートウェイシステム。

【請求項２】前記プロクシゲートキーパが、呼制御シグナリング機能を有することを特徴とする請求項１に記載のゲートウェイシステム。

【請求項３】前記ゲートウェイが、前記プロクシゲートキーパへの参加要求の送信に対し参加拒否を受信した場合、前記マスタゲートキーパへ参加要求を送信することを特徴とする請求項１または請求項２に記載のゲートウェイシステム。

【請求項４】プロクシゲートキーパとゲートウェイとが、同一の装置内に収容されることを特徴とする請求項１～請求項３のいずれかに記載のゲートウェイシステム。

【請求項５】前記マスタゲートキーパ、プロクシゲートキーパ、ゲートウェイのうちいずれかが他のゾーンと通信する際に、ネットワークアドレスとポート番号とを変換するネットワークアドレス＆ポート番号変換装置を有することを特徴とする請求項１～請求項４のいずれかに記載のゲートウェイシステム。

【請求項６】前記マスタゲートキーパが、前記ゲートウェイへマスタゲートキーパのシグナリング用トランスポートアドレスを通知し、他のゾーンと通信する際に、前記ネットワークアドレス＆ポート番号変換装置が、マスタゲートキーパのネットワークアドレスおよびポート番号とプロクシゲートキーパのネットワークアドレスおよびポート番号とを変換することを特徴とする請求項５に記載のゲートウェイシステム。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、H.323を用いた通信システムにおいて、ゲートキーパ機能を分割し、一部をゲートウェイ装置に実装することで、より多くのゲー

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用いられ、プロトコル変換を行う。H.323モデルでゾーンは一つのゲートキーパと一つ以上のエンドト(ゲートウェイまたはH.32端末)で構成される。トキーパは、アドレス変換、アクセス変換制御お域管理などを行い、ゲートウェイを制御する。1のゲートウェイが多くなった場合には、複数のゲーパを用意することでゲートキーパの処理の輻輳するが、ゲートウェイは同時に一つのゲートキーか登録できないため、ゲートウェイがゲートキー構成される複数ゾーンに分割される。

【０００３】

【発明が解決しようとする課題】しかしながら、従来技術には、次のような問題点があった。

【０００４】第１の問題点は、ゲートウェイ数がままで複数ゾーン構成とした場合は呼損率が大きことである。その理由は、1ゾーンの規模縮小に大群化効果が薄くなるからである。逆に1ゾーンの呼損率を維持するためには、ゲートウェイの設多くなってしまう。

【０００５】第２の問題点は、1ゾーン構成の場ートキーパの能力により収容可能なゲートウェイ限があることである。１つのゾーンにより多くのウェイを収容するためには、より高性能のゲートを利用しなければならない。

【０００６】本発明は、以上の問題点を解決するH.323を用いた通信システムにおいて、ゲートキー能を分割し、一部をゲートウェイ装置に実装するで、より多くのゲートウェイを１つのゲートキー容することができるゲートウェイシステムを提供とを目的とする。

【０００７】

【課題を解決するための手段】上述の課題を解決め、本発明のゲートウェイシステムは、H.323を用通信システムにて、他のゾーンとの通信のアドレ機能、ゾーン管理機能および呼制御シグナリング含むゲートウェイ制御機能を有するマスタゲートと、このマスタゲートキーパのゲートウェイ制御うちアドレス変換機能およびゾーン管理機能を有ロクシゲートキーパと、他のゾーンとの通信のプル変換をするゲートウェイとを具備することを特る。

【０００８】以上の構成によって、ゲートウェイ

ウェイ装置２は．プロクシゲートキーパ２１と．ゲートウェイ２２とを備えている。マスタゲートキーパ１と、ゲートウェイ装置２とで．H.323にて記述されたゾーン６を構成し、他のゾーン７のゲートキーパ４やエンドポイント５との通信はネットワークアドレス＆ポート番号変換装置３を経由して行う。

【００１１】図２に示すように、従来のH.323ゲートキーパ８の機能を．マスタゲートキーパ１とプロクシゲートキーパ２１とにより機能分散する。プロクシゲートキーパ２１では．従来H.323ゲートキーパ８が処理していたゲートウェイ制御機能のうち、アドレス変換機能２１ａおよびゾーン管理機能２１ｂを持ち．ゲートウェイからのアクセス集中によるボトルネックを解消する。マスタゲートキーパ１は、アドレス変換機能１ａ、ゾーン管理機能１ｂの他に、承認制御機能１ｃ．帯域幅制御機能１ｄ．呼制御シグナリング機能１ｅ．呼認可機能１ｆ、帯域幅管理機能１ｇ、呼管理機能１ｈを持つ。

【００１２】ネットワークアドレス＆ポート番号変換装置３は、マスタゲートキーパ１、プロクシゲートキーパ２１．ゲートウェイ２２のうちいずれかが他のゾーン７と通信する際に．ネットワークアドレスおよびポート番号を変換する機能を持つ。ポート番号とはトランスポート層におけるアドレスである。特にプロクシゲートキーパ２１のネットワークアドレスおよびポート番号を、マスタゲートキーパ１のネットワークアドレスおよびポート番号に変換することで．他のゾーン７のゲートキーパ４やエンドポイント５からはプロクシゲートキーパ２１の代わりにマスタゲートキーパ１がゾーン６のゲートキーパであるように見える。

【００１３】ゲートウェイ２２は、従来のH.323ゲートウェイ機能に加え、プロクシゲートキーパ２１で参加拒否された呼への参加要求を．改めてマスタゲートキーパ１へ要求する機能を持つ。

【００１４】次に、図１．図３、図４及び図５を参照して本実施の形態の動作について詳細に説明する。

【００１５】図３において．ゲートウェイ２２がエンドポイント５に発信する場合．プロクシゲートキーパ２１に対して参加要求Ａ１を送信する。プロクシゲートキーパ２１ではアドレス変換機能により．他ゾーン７のゲートキーパ４に位置情報要求Ａ２を送るが、途中ネットワークアドレス＆ポート番号変換装置３を経由する際に、位置情報要求Ａ２内のプロクシゲートキーパ２１のネットワークアドレス＆ポート番号をマスタゲートキーパ１のネットワークアドレス＆ポート番号に変換する。

番号変換装置３を経由する際に、位置情報確認Ａ５内のマスタゲートキーパ１のネットワークアドレス＆ポート番号をプロクシゲートキーパ２１のネットワークアドレス＆ポート番号に変換した位置情報確認Ａ５を転送する。プロクシゲートキーパ２１では位置情報確認Ａ５を受信される。プロクシゲートキーパ２１は．参加要求を受け入れるのであれば許可確認Ａ６をゲートウェイ２２へ送信する。ゲートウェイ２２では．許可確認Ａ６で指定されたトランスポートアドレスに対し、シグナリングチャネルＡ７を開設する。

【００１７】一方、図４において、ゲートウェイ２２がプロクシゲートキーパ２１にない機能を必要とする場合、要求Ｂ１を送信した場合．プロクシゲートキーパ２１は参加拒否Ｂ６を送る。なお、位置情報要求Ｂ２～位置情報確認Ｂ５までの手順は図３における位置情報要求Ａ２～位置情報確認Ａ５までの手順と同じである。参加拒否Ｂ６を受信したゲートウェイ２２では、改めてマスタゲートキーパ１に対し参加要求Ｂ７を送信する。マスタゲートキーパ１は、参加要求を受け入れるのであれば．許可確認Ｂ８をゲートウェイ２２へ送信する。ゲートウェイ２２では、許可確認Ｂ８で指定されたトランスポートアドレスに対し、シグナリングチャネルＢを開設する。

【００１８】また、図５において、マスタゲートキーパ１にてシグナリングチャネルを中継する場合を説明する。これは、マスタゲートキーパ１がゲートウェイに通知する許可確認Ｃ８において、エンドポイントのシグナリング用トランスポートアドレスの代わりにマスタゲートキーパ１のシグナリング用トランスポートアドレスを通知する点で図４の例と異なる。これによりゲートウェイ２２とエンドポイント５との間のシグナリングチャネルは直接開設されず、ゲートウェイ２２とマスタゲートキーパ１とのシグナリングチャネルＣ９、マスタゲートキーパ１とエンドポイント５とのシグナリングチャネルＣ１０とが開設される。

【００１９】次に、具体例を用いて本実施の形態を説明する。例えば、図３においてゲートウェイからエンドポイント５の別名アドレスである‘012-89’に対し発信を行う場合．まず、ゲートウェイからプロクシゲートキーパ２１に対し．この別名アドレス‘012-345-6789’への参加要求Ａ１を送信する。プロクシゲートキーパ２１では．この別名アドレス‘01

バ１が送信したように見える。

【００２０】ゲートキーパ４では位置情報要求Ａ３に対しエンドポイント５に対するシグナリング用のトランスポートアドレス '10.1.2.3:1720' を含めた位置情報確認Ａ４で応答する。位置情報確認Ａ４が途中ネットワークアドレス&ポート番号変換装置３を経由する際に、位置情報確認Ａ４のヘッダ内にあるマスタゲートキーパ１のネットワークアドレス&ポート番号 "10.4.5.6:10001" をプロクシゲートキーパ２１のネットワークアドレス&ポート番号 "10.7.8.9:5001" に変換した位置情報確認Ａ５を転送し、マスタゲートキーパ１でなくプロクシゲートキーパ２１で位置情報確認Ａ５が受信される。位置情報確認Ａ５の受信によりプロクシゲートキーパ２１ではエンドポイント５に対するトランスポートアドレス '10.1.2.3:1720' を得る。その後、エンドポイント５に対するトランスポートアドレス '10.1.2.3:1720' を含む許可確認Ａ６をゲートウェイ２２へ送信する。ゲートウェイ２２では、指定されたトランスポートアドレス '10.1.2.3:1720' に対し、シグナリングチャネルＡ７を開設する。

【００２１】また、図４においてゲートウェイ２２がエンドポイント５の別名アドレスである '012-345-6789' に対し発信するためにユーザ認証を含む参加要求Ｂ１をプロクシゲートキーパ２１に送信した場合、プロクシゲートキーパ２１では認証機能を持たないので、参加拒否Ｂ６を送る。なお、位置情報要求Ｂ２の送信から位置情報確認Ｂ５の応答受信までの手順は図３の位置情報要求Ａ２の送信から位置情報確認Ａ５の手順と同じである。参加拒否Ｂ６を受信したゲートウェイ２２では、改めてマスタゲートキーパ１に対し参加要求Ｂ７を送信する。マスタゲートキーパ１は、ユーザ認証が成功し参加要求を受け入れるのであれば、参加要求Ｂ８をゲートウェイ２２へ送信する。ゲートウェイ２２では、許可確認Ｂ８で指定されたトランスポートアドレスに対し、シグナリングチャネルＢ９を開設する。

【００２２】また、図５においてゲートウェイ２２からエンドポイント５の別名アドレスである '012-345-6789' に対し発信を行う場合、参加要求Ｃ１から参加要求Ｃ７までの手順は図４の参加要求Ｂ１から参加要求Ｂ７までの手順と同じである。マスタゲートキーパ１では、許可確認Ｃ８でエンドポイント５に対するトランスポートアドレス '10.1.2.3:1720' の代わりにマスタゲートキーパ１が送信したように見える。

【００２３】次に、本発明の他の実施の形態について図面を参照して詳細に説明する。図６および図７の形態は、マスタゲートキーパ１の代わりにプロキシゲートキーパ２１がゾーン６のゲートキーパと他ゾーンから見える点で図３～図５の例と異なる。

【００２４】図６において、ゲートウェイ２２がエンドポイント５に発信する場合、プロクシゲートキーパに対して参加要求Ｄ１を送信する。プロクシゲートキーパ２１ではアドレス変換機能により、他ゾーン７のゲートキーパ４に位置情報要求Ｄ２を送り、位置情報確認Ｄ３の応答でエンドポイント５に対するシグナリングトランスポートアドレスを得る。プロクシゲートキーパ２１は、参加要求Ｄ１を受け入れるのであれば許可確認Ｄ４をゲートウェイ２２へ送信する。ゲートウェイ２２では、許可確認Ｄ４で指定されたトランスポートアドレスに対し、シグナリングチャネルＤ５を開設する。

【００２５】一方、図７において、ゲートウェイ２２がプロクシゲートキーパ２１にない機能を要求する場合、要求Ｅ１を送信した場合、プロクシゲートキーパ２１は参加拒否Ｅ４を送る。参加拒否Ｅ４を受信したゲートウェイ２２では、改めてマスタゲートキーパ１に対し要求Ｅ５を送信する。マスタゲートキーパ１は、参加要求を受け入れるのであれば、参加要求Ｅ６をゲートウェイ２２へ送信する。ゲートウェイ２２では、参加確認Ｅ６で指定されたトランスポートアドレスに対し、シグナリングチャネルＥ７を開設する。

【００２６】次に、具体例について説明する。例えば図６においてゲートウェイ２２からエンドポイントの別名アドレスである '012-345-6789' に対し発信する場合、まず、ゲートウェイ２２からプロクシゲートキーパ２１に対し、この別名アドレス '012-345-6789' の参加要求Ｄ１を送信する。プロクシゲートキーパ２１は、この別名アドレス '012-345-6789' を収容するゲートキーパ４に対し、位置情報要求Ｄ２を送り、位置情報確認Ｄ３の応答でエンドポイント５に対するトランスポートアドレス '10.1.2.3:1720' を得る。その後、エンドポイント５に対するトランスポートアドレス '10.1.2.3:1720' を含む許可確認Ｄ４をゲートウェイ２２へ送信する。ゲートウェイ２２では、指定されたトランスポートアドレス '10.1.2.3:1720' に対し、シグナ

るのであれば．参加要求Ｅ６をゲートウェイ２２へ送信する。ゲートウェイ２２では、参加要求Ｅ６で指定されたトランスポートアドレスに対し、シグナリングチャネルＥ７を開設する。

【００２８】次に、さらに他の実施の形態について図面を参照して詳細に説明する。図８、図９および図１０の実施の形態は．図８を参照すると、ブロクシゲートキーパ２１が、図２に示された実施の形態におけるアドレス変換機能２１ａ．ゾーン管理機能２２Ｂに加え．呼制御シグナリング機能２１ｅを有する点で図６、図７の例と異なる。それにより、ブロクシゲートキーパ２１の判断により図９で示すようにゲートウェイ２２とエンドポイント５との間のシグナリングチャネルは直接開設されず．ゲートウェイ２２とブロクシゲートキーパ２１とのシグナリングチャネルＦ５と、ブロクシゲートキーパ２１とエンドポイント５とのシグナリングチャネルＦ６とが開設されることが可能となる。

【００２９】また、図１０を参照すると、本実施の形態は．マスタゲートキーパ１がゲートウェイ２２に通知する許可確認Ｇ６において．エンドポイント５のシグナリング用トランスポートアドレスの代わりに、マスタゲートキーパ１のシグナリング用トランスポートアドレスを通知した点で異なる。これにより、ゲートウェイ２２とエンドポイント５との間のシグナリングチャネルは直接開設されず、ゲートウェイ２２とマスタゲートキーパ１とのシグナリングチャネルＧ７と、マスタゲートキーパ１とエンドポイント５とのシグナリングチャネルＧ８とが開設される。

【００３０】シグナリングチャネルＧ８上で送受信される信号が、ネットワークアドレス&ポート番号変換装置３を通過する毎に、マスタゲートキーパ１のネットワークアドレスおよびポート番号とブロクシゲートキーパ２１のネットワークアドレスおよびポート番号とが変換される。その結果．エンドポイント５からは、シグナリングチャネルＧ８はブロクシゲートキーパ２１との間に開設されたシグナリングチャネルＧ９のように見える。

【００３１】次に、具体例について説明する。例えば、図９においてゲートウェイ２２からエンドポイント５の別名アドレスである‘012-345-6789’に対し発信を行う場合．ます、ゲートウェイ２２からブロクシゲートキーパ２１に対し．この別名アドレス‘012-345-6789’への参加要求Ｆ１を送信する。ブロクシゲートキーパ２１でランスポートアドレス‘10.4.5.6:1720’に対し、ナリングチャネルＦ５を開設する。

【００３２】さらにブロクシゲートキーパからエイント５に対するトランスポートアドレス‘10.1720’に対し、シグナリングチャネルＦ６を開設シグナリングチャネルＦ５とシグナリングチャネが．ゲートウェイ２２とエンドポイント５とのシングチャネルとなる。

【００３３】また、図１０においてゲートウェイらエンドポイント５の別名アドレスである‘012-89’に対し発信を行う場合．参加要求Ｇ１から参Ｇ５までの手順は図７の参加要求Ｅ１から参加要までの手順と同じである。マスタゲートキーパ１許可確認Ｇ６でエンドポイント５に対するトラントアドレス‘10.1.2.3:1720’の代わりにマスタキーパ１自身のトランスポートアドレス‘10.4.50’を含む許可確認Ｇ６をゲートウェイ２２へ送る。ゲートウェイ２２では．指定されたトランスアドレス‘10.4.5.7:1720’に対し、シグナリンネルＧ７を開設する。さらにマスタゲートキーパエンドポイント５に対するトランスポートアドレ0.1.2.3:1720’に対し、シグナリングチャネルＧ設する。シグナリングチャネルＧ７とシグナリンネルＧ８が、ゲートウェイ２２とエンドポイントシグナリングチャネルとなる。

【００３４】ここで、マスタゲートキーパ１からポイント５へ送られる信号内にあるマスタゲート１のネットワークアドレスおよびポート番号は．ワークアドレス&ポート番号変換装置３を中継すで．ブロクシゲートキーパ２１のネットワークアおよびポート番号に変換される。逆にエンドポイからマスタゲートキーパ１へ送られる信号内にあクシゲートキーパ２１のネットワークアドレスおート番号は、ネットワークアドレス&ポート番号置３を中継する時点で、マスタゲートキーパ１のワークアドレスおよびポート番号に変換される。て．シグナリングチャネルＧ８はエンドポイント見た場合、ブロクシゲートキーパ２１との間に開たシグナリングチャネルＧ９のように見える。

【００３５】以上述べたように、ゲートウェイ２ンドポイント５に発信する場合、まずブロクシゲーパ２１にH.323通信への参加要求を行う。ブロ

加要求を行う。マスタゲートキーパ１は、ゲートウェイ２２の参加要求を認めるか否かの判断を行い、許可確認または参加拒否をゲートウェイ２２に通知する。ゲートウェイ２２では、プロクシゲートキーパ２１またはマスタゲートキーパ１からの許可確認を受信後、シグナリングチャネルをエンドポイント５との間に開設し、後のH.323の手順を行う。

【００３７】これにより、従来1つのゲートキーパで処理可能であったゲートウェイの数よりも多くのゲートウェイを処理することが可能となる。

【００３８】

【発明の効果】以上説明したように、本発明は、ゲートウェイのアドレス変換要求をゲートウェイ装置内部のプロクシゲートキーパで処理し、マスタゲートキーパの負荷を軽減するので、従来1つのゲートキーパで処理可能であったゲートウェイの数よりも多くのゲートウェイを処理することが可能となる。その結果、ゲートウェイの数を増やすにつれ、ゲートキーパの処理能力を向上させたり、ゲートキーパを追加したりする必要がなくなる。

【００３９】また、ゲートウェイのアドレス変換要求をゲートウェイ装置内部のプロクシゲートキーパで処理することによって、アドレス変換のみを必要とするゲートウェイの処理待ち時間を短縮できる。

【図面の簡単な説明】

【図１】本発明のゲートウェイシステムの構成図である。

＊【図２】H.323ゲートキーパの機能ブロック図である。

【図３】ゲートウェイとエンドポイント間の送受信図である。

【図４】ゲートウェイとエンドポイント間の送受信図である。

【図５】ゲートウェイとエンドポイント間の送受信図である。

【図６】ゲートウェイとエンドポイント間の送受信図である。

【図７】ゲートウェイとエンドポイント間の送受信図である。

【図８】H.323ゲートキーパの機能ブロック図である。

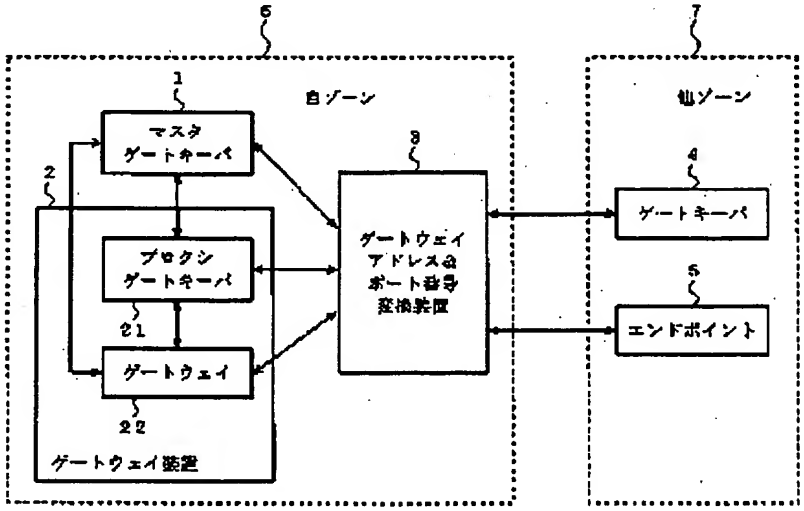
【図９】ゲートウェイとエンドポイント間の送受信図である。

【図１０】ゲートウェイとエンドポイント間の送信説明図である。

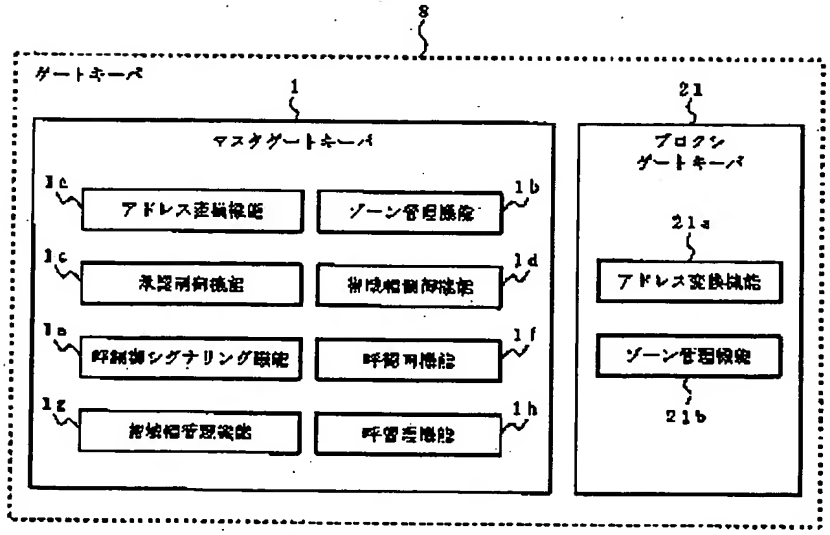
【符号の説明】

１　マスタゲートキーパ
２　ゲートウェイ装置
３　ネットワークアドレス＆ポート番号変換装置
４　ゲートキーパ
５　エンドポイント
６　H.323ゾーン
７　他のゾーン
２１　プロクシゲートキーパ
＊　２２　ゲートウェイ

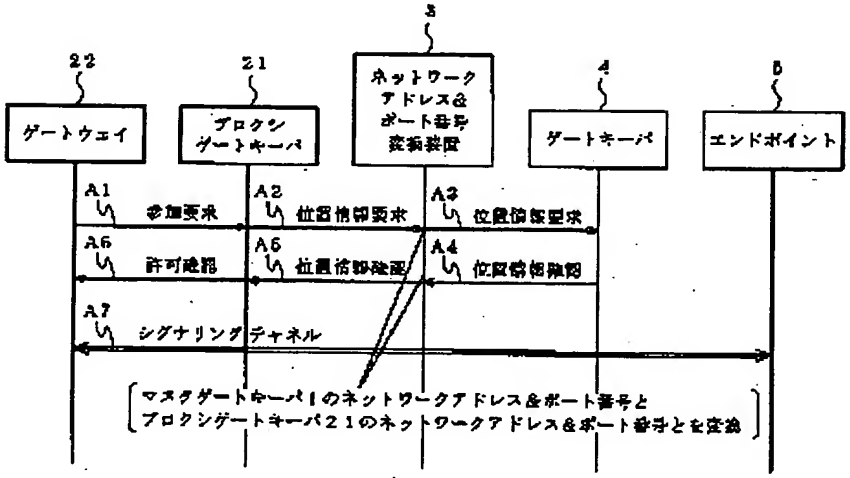
【図１】



【図2】

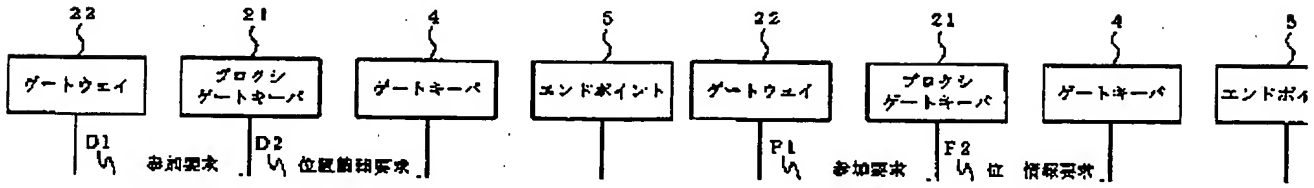

8
ゲートキーパ
1
マスタゲートキーパ
1a
アドレス変換機能
1b
ゾーン管理機能
1c
承認制御機能
1d
帯域幅制御機能
1e
呼制御シグナリング機能
1f
呼認可機能
1g
帯域幅管理機能
1h
呼管理機能
21
プロクシゲートキーパ
21a
アドレス変換機能
ゾーン管理機能
21b

【図3】

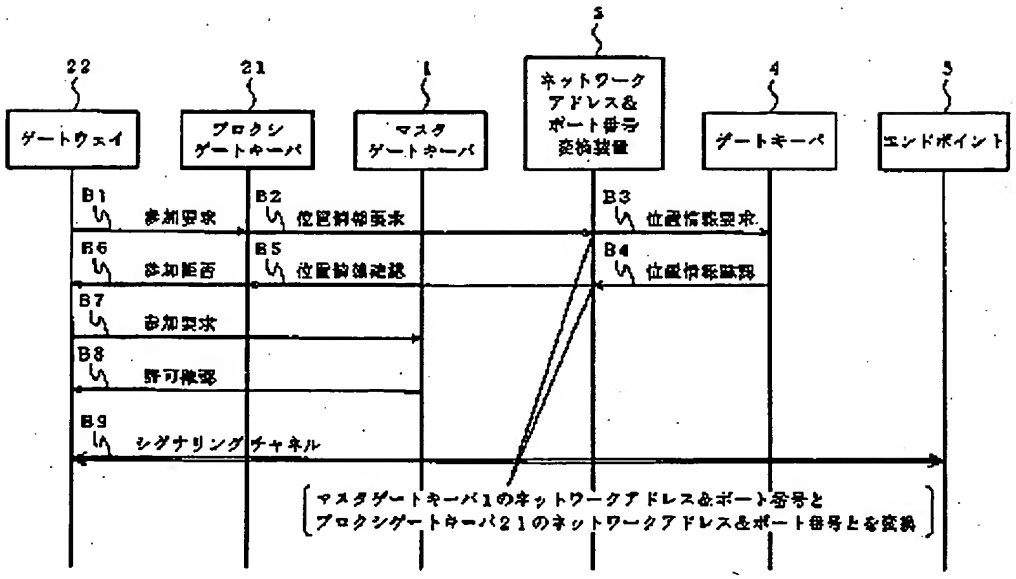

3
22
21
ネットワークアドレス&ポート番号変換装置
4
5
ゲートウェイ
プロクシゲートキーパ
ゲートキーパ
エンドポイント
A1
参加要求
A2
位置情報要求
A3
位置情報要求
A6
許可通知
A5
位置情報応答
A4
位置情報通知
A7
シグナリングチャネル
マスタゲートキーパ1のネットワークアドレス&ポート番号と
プロクシゲートキーパ21のネットワークアドレス&ポート番号とを変換

【図6】

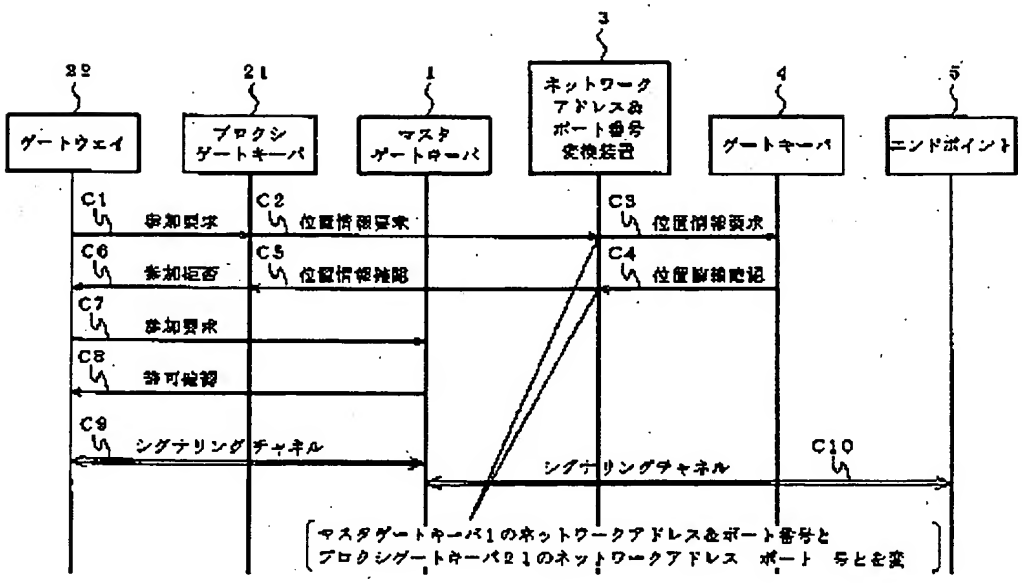
【図9】


22
21
4
5
22
21
4
5
ゲートウェイ
プロクシゲートキーパ
ゲートキーパ
エンドポイント
ゲートウェイ
プロクシゲートキーパ
ゲートキーパ
D1
D2
P1
F2

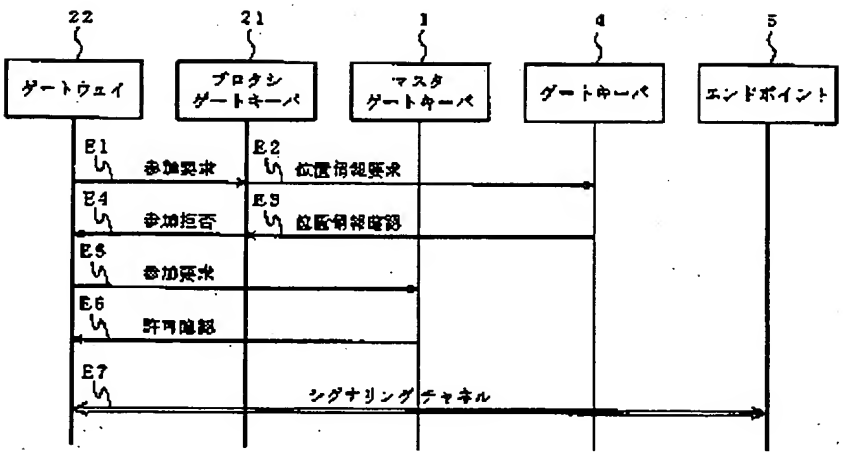
【図４】


3
22
21
1
ネットワーク
アドレス&
ポート番号
変換装置
4
5
ゲートウェイ
プロクシ
ゲートキーパ
マスタ
ゲートキーパ
ゲートキーパ
エンドポイント
B1
参加要求
B2
位置情報要求
B3
位置情報要求
B6
参加拒否
B5
位置情報確認
B4
位置情報確認
B7
参加要求
B8
許可確認
B9
シグナリングチャネル
マスタゲートキーパ1のネットワークアドレス&ポート番号と
プロクシゲートキーパ21のネットワークアドレス&ポート番号とを変換

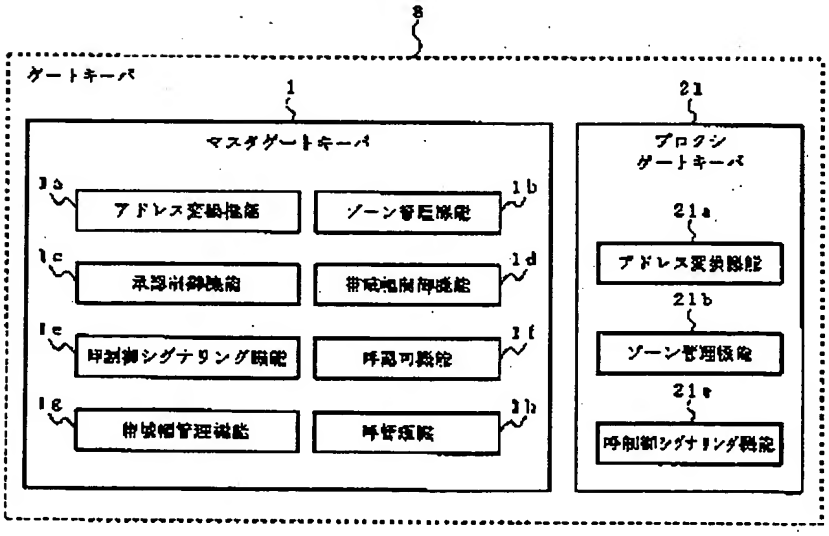
【図５】


3
22
21
1
ネットワーク
アドレス&
ポート番号
変換装置
4
5
ゲートウェイ
プロクシ
ゲートキーパ
マスタ
ゲートキーパ
ゲートキーパ
エンドポイント
C1
参加要求
C2
位置情報要求
C3
位置情報要求
C6
参加拒否
C5
位置情報確認
C4
位置情報確認
C7
参加要求
C8
許可確認
C9
シグナリングチャネル
C10
シグナリングチャネル
マスタゲートキーパ1のネットワークアドレス&ポート番号と
プロクシゲートキーパ21のネットワークアドレス　ポート　号とを変

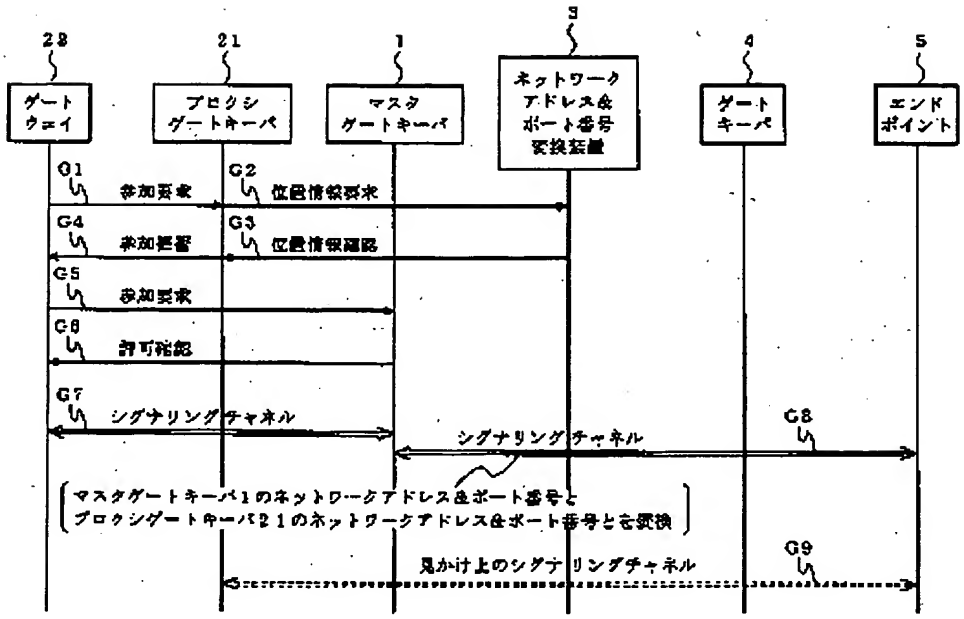
【図７】


22
21
1
4
5
ゲートウェイ
プロクシ ゲートキーパ
マスタ ゲートキーパ
ゲートキーパ
エンドポイント
E1
参加要求
E2
位置情報要求
E4
参加拒否
E5
位置情報確認
E6
許可確認
E7
シグナリングチャネル

【図８】


8
ゲートキーパ
1
マスタゲートキーパ
1a
アドレス変換機能
1b
ゾーン管理機能
1c
承認制御機能
1d
帯域制御機能
1e
呼制御シグナリング機能
1f
呼認可機能
1g
帯域幅管理機能
1h
呼管理機能
21
プロクシ ゲートキーパ
21a
アドレス変換機能
21b
ゾーン管理機能
21c
呼制御シグナリング機能

【図１０】


28
21
1
3
4
5
ゲートウェイ
プロクシゲートキーパ
マスタゲートキーパ
ネットワークアドレス&ポート番号変換装置
ゲートキーパ
エンドポイント
G1
参加要求
G2
位置情報要求
G4
参加拒否
G3
位置情報確認
G5
参加要求
G6
許可確認
G7
シグナリングチャネル
シグナリングチャネル
G8
マスタゲートキーパ1のネットワークアドレス&ポート番号と
プロクシゲートキーパ21のネットワークアドレス&ポート番号とを変換
G9
見かけ上のシグナリングチャネル

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] In the communication system which used H.323, this invention divides gatekeeper ability and relates to the gateway system by the H.323 gatekeeper ability division which can hold more gateways in one gatekeeper by mounting a part in a gateway unit.
[0002]
[Description of the Prior Art] Conventionally, an H.323 gateway system is used in order to relay communication by ITU-T recommendation H.323 which is the standard specifications of quality-of-service un-guaranteeing type LAN (for example, Ethernet (registered trademark) etc.), and communication [in addition to H.323], and it performs protocol conversion. H. One zone is constituted from one or more end points (the gateway or H.323 terminal) by 323 models with one gatekeeper. A gatekeeper performs address translation, access conversion control, band management, etc., and controls the gateway. Although the congestion of processing of a gatekeeper is avoided by preparing two or more gatekeepers when the gateway of one zone increases, since the gateway can be simultaneously registered only into one gatekeeper, it is divided into two or more zones where the gateway is constituted for every gatekeeper.
[0003]
[Problem(s) to be Solved by the Invention] However, there were the following troubles in the above-mentioned conventional technology.
[0004] While the 1st trouble has had the the same number of the gateways, when it considers as two or more zone composition, a lost call rate is with a bird clapper greatly. The reason is that a large herd-ized effect becomes thin according to the degradation of one zone. Conversely, in order to maintain a lost call rate equivalent to one zone, the number of facilities of the gateway will increase.
[0005] In 1 zone composition, the 2nd trouble is that an upper limit is in the number of the gateways which can be held according to a gatekeeper's capacity. In order to hold many gateways by one zone, you have to use a more highly efficient gatekeeper.
[0006] In order that this invention may solve the above trouble, in the communication system using H.323, it divides gatekeeper ability and aims at offering the gateway system which can hold more gateways in one gatekeeper by mounting a part in a gateway unit.
[0007]
[Means for Solving the Problem] In order to solve an above-mentioned technical problem, the gateway system of this invention is characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system which used H.323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.
[0008] By the above composition, the address translation demand of the gateway is processed by the proxy gatekeeper, and a master gatekeeper's load is mitigated.
[0009]
[Embodiments of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing.
[0010] ** [reference of drawing 1 / contain / the master gatekeeper 1, a gateway unit 2, and the network

address & port number inverter 3 / the gestalt of this operation] The gateway unit 2 is equipped with the proxy gatekeeper 21 and the gateway 22. The zone 6 described by H.323 is constituted from a master gatekeeper 1 and a gateway unit 2, and the gatekeeper 4 of other zones 7 and communication with an end point 5 are performed via the network address & port number inverter 3.

[0011] As shown in drawing 2 , functional distribution of H.323 conventional gatekeeper's 8 function is carried out by the master gatekeeper 1 and the proxy gatekeeper 21. In the proxy gatekeeper 21, it has address translation function 21a and zone function manager 21b among the gateway control functions which H.323 gatekeeper 8 was processing conventionally, and the bottleneck by the access concentration from the gateway is canceled. The master gatekeeper 1 has recognition control function 1c, 1d of bandwidth-control functions, call control signaling function 1e, 1f of call license functions, 1g of bandwidth function managers, and 1h of call function managers other than address translation function 1a and zone function manager 1b.

[0012] The network address & port number inverter 3 has the function to change a network address and a port number, in case either communicates with other zones 7 among the master gatekeeper 1, the proxy gatekeeper 21, and the gateway 22. A port number is the address in a transport layer. From other gatekeepers 4 and end points 5 of a zone 7, the master gatekeeper 1 seems to be the gatekeeper of a zone 6 instead of the proxy gatekeeper 21 by changing the proxy gatekeeper's 21 network address and port number into the master gatekeeper's 1 network address and port number especially.

[0013] In addition to the conventional H.323 gateway function, the gateway 22 has the function to require anew the participating demand to the call by which participating refusal was carried out by the proxy gatekeeper 21 of the master gatekeeper 1.

[0014] Next, with reference to drawing 1 , drawing 3 , drawing 4 , and drawing 5 , operation of the gestalt of this operation is explained in detail.

[0015] In drawing 3 , when the gateway 22 sends to an end point 5, the participating demand A1 is transmitted to the proxy gatekeeper 21. In the proxy gatekeeper 21, the positional information demand A3 which changed the network address & port number of the proxy gatekeeper 21 in the positional information demand A2 into the master gatekeeper's 1 network address & port number when it went via the network address & port number inverter 3 the middle, although the positional information demand A2 was sent to the gatekeeper 4 of the other zones 7 is transmitted by the address translation function, and the positional information demand A3 is received in a gatekeeper 4.

[0016] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number of the master gatekeeper 1 in the positional information check A4 into the proxy gatekeeper's 21 network address & port number is transmitted, and positional information check A5 is received in the proxy gatekeeper 21. The proxy gatekeeper 21 will transmit the permission check A6 to the gateway 22, if the participating demand A1 is accepted. In the gateway 22, the signaling channel A7 is established to the transport address specified by the permission check A6.

[0017] When the participating demand B1 which, on the other hand, needs the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 4 is transmitted, participating refusal B6 is sent in the proxy gatekeeper 21. In addition, the procedure from positional information demand B-2 to positional information check B5 is the same as the procedure from the positional information demand A2 in drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the permission check B8 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0018] Moreover, in drawing 5 , the case where a signaling channel is relayed by the master gatekeeper 1 is explained. This differs from the example of drawing 4 instead of the transport address for signaling of an end point 5 at the point which notifies the master gatekeeper's 1 transport address for signaling in the permission check C8 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel C9 of the gateway 22 and the master gatekeeper 1 and the signaling channel C10 of the master gatekeeper 1 and an end point 5 are established.

[0019] Next, operation of the gestalt of this operation is explained using an example. For example, when

sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 3 , the participating demand A1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the network address & port number inverter 3 which sends the positional information demand A2 and carries out a course the middle in the proxy gatekeeper 21 to the gatekeeper 4 who holds this alias address '012-345-6789' The positional information demand A3 which changed the network address & port number "10.7.8.9:5001" of the proxy gatekeeper 21 in the header of the positional information demand A2 into the master gatekeeper's 1 network address & port number "10.4.5.6:10001" It transmits and seems that the master gatekeeper 1 transmitted in a gatekeeper 4 at the time of positional information demand A3 reception.

[0020] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 '10.1.2.3:1720' to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number "10.4.5.6:10001" of the master gatekeeper 1 in the header of the positional information check A4 into the proxy gatekeeper's 21 network address & port number "10.7.8.9:5001" is transmitted, and positional information check A5 is received not by the master gatekeeper 1 but by the proxy gatekeeper 21. By the proxy gatekeeper 21, the transport address '10.1.2.3:1720' over an end point 5 is acquired by reception of positional information check A5. Then, the permission check A6 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel A7 is established to the specified transport address '10.1.2.3:1720'.

[0021] Moreover, by the proxy gatekeeper 21, in order that the gateway 22 may send to '012-345-6789' which is the alias address of an end point 5 in drawing 4 , when the participating demand B1 containing user authentication is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, participating refusal B6 is sent. In addition, the procedure from transmission of positional information demand B-2 to response reception of positional information check B5 is the same as the procedure of transmission of the positional information demand A2 of drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand B8 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0022] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 5 , the procedure from the participating demand C1 to the participating demand C7 is the same as the procedure from the participating demand B1 of drawing 4 to the participating demand B7. In the master gatekeeper 1, the permission check C8 which includes the transport address '10.4.5.6:1720' of master gatekeeper 1 self by the permission check C8 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel C9 is established to the specified transport address '10.4.5.6:1720'. Furthermore, the signaling channel C10 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel C9 and the signaling channel C10 turn into a signaling channel of the gateway 22 and an end point 5.

[0023] Next, the gestalt of other operations of this invention is explained in detail with reference to a drawing. The gestalt of operation of drawing 6 and drawing 7 differs from the example of drawing 3 - drawing 5 at the point by which the proxy gatekeeper 21 is seen from the other zones 7 with the gatekeeper of a zone 6 instead of the master gatekeeper 1.

[0024] In drawing 6 , when the gateway 22 sends to an end point 5, the participating demand D1 is transmitted to the proxy gatekeeper 21. At the proxy gatekeeper 21, by the address translation function, the positional information demand D2 is sent to the gatekeeper 4 of the other zones 7, and the transport address for signaling over an end point 5 is acquired by the response of the positional information check D3. The proxy gatekeeper 21 will transmit the permission check D4 to the gateway 22, if the participating demand D1 is accepted. In the gateway 22, the signaling channel D5 is established to the transport address specified by the permission check D4.

[0025] When the participating demand E1 which, on the other hand, requires the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 7 is transmitted, the participating refusal E4 is sent in the proxy gatekeeper 21. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating

demand E6 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.
[0026] Next, an example is explained. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 6 , the participating demand D1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand D2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check D3. Then, the permission check D4 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel D5 is established to the specified transport address '10.1.2.3:1720'.
[0027] Moreover, by the proxy gatekeeper 21, when the participating demand E1 whose gateway 22 contains user authentication in drawing 7 is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, the participating refusal E4 is sent. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.
[0028] Next, the gestalt of other operations is further explained in detail with reference to a drawing. Reference of drawing 8 of the gestalt of operation of drawing 8 , drawing 9 , and drawing 10 changes it with the example of drawing 6 and drawing 7 in that the proxy gatekeeper 21 has call control signaling function 21e in addition to address translation function 21a in the gestalt of operation shown in drawing 2 , and zone function manager 22B. It becomes possible not to establish the signaling channel between the gateway 22 and an end point 5 directly by that cause, as drawing 9 shows by judgment of the proxy gatekeeper 21, but to establish the signaling channel F5 of the gateway 22 and the proxy gatekeeper 21, and the signaling channel F6 of the proxy gatekeeper 21 and an end point 5.
[0029] Moreover, reference of drawing 10 changes the gestalt of this operation instead of the transport address for signaling of an end point 5 at the point which notified the master gatekeeper's 1 transport address for signaling in the permission check G6 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel G7 of the gateway 22 and the master gatekeeper 1 and the signaling channel G8 of the master gatekeeper 1 and an end point 5 are established.
[0030] Whenever the signal transmitted and received on the signaling channel G8 passes the network address & port number inverter 3, the master gatekeeper's 1 network address, the network address of a port number and the proxy gatekeeper 21, and a port number are changed. Consequently, from an end point 5, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21.
[0031] Next, an example is explained. for example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 9 , the participating demand F1 to this alias address '012-345-6789' is transmitted from measure and the gateway 22 to the proxy gatekeeper 21 By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand F2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check F3. Then, the permission check F4 which includes a proxy gatekeeper's own transport address '10.4.5.6:1720' instead of the transport address over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel F5 is established to the specified transport address '10.4.5.6:1720'.
[0032] Furthermore, the signaling channel F6 is established from a proxy gatekeeper to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel F5 and the signaling channel F6 turn into a signaling channel of the gateway 22 and an end point 5.
[0033] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 10 , the procedure from the participating demand G1 to the participating demand G5 is the same as the procedure from the participating demand E1 of drawing 7 to the participating demand E5. In the master gatekeeper 1, the permission check G6 which includes the transport address '10.4.5.7:1720' of master gatekeeper 1 self by the permission check G6 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel G7 is established to the specified transport address '10.4.5.7:1720'. Furthermore, the signaling channel G8 is established from the master

gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel G7 and the signaling channel G8 turn into a signaling channel of the gateway 22 and an end point 5.
[0034] Here, when the master gatekeeper's 1 network address and port number in the signal sent to an end point 5 from the master gatekeeper 1 relay the network address & port number inverter 3, they are changed into the proxy gatekeeper's 21 network address and port number. Conversely, when the proxy gatekeeper's 21 network address and port number in the signal sent to the master gatekeeper 1 from an end point 5 relay the network address & port number inverter 3, they are changed into the master gatekeeper's 1 network address and port number. Therefore, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21, when it sees from an end point 5.
[0035] Like, when [which was described above] the gateway 22 sends to an end point 5, the participating demand to H.323 communication is first given to the proxy gatekeeper 21. The proxy gatekeeper 21 searches for the arrival-of-the-mail place address of an end point 5 by the address translation function. And in accepting a participating demand, it notifies to a permission check at the gateway 22 including the arrival-of-the-mail place address. In not accepting a participating demand, it notifies the participating refusal including the arrival-of-the-mail place address to the gateway 22.
[0036] In the gateway 22, when participating refusal is carried out, the participating demand to H.323 communication is anew given to the master gatekeeper 1. The master gatekeeper 1 judges whether the participating demand of the gateway 22 is accepted, and notifies a permission check or participating refusal to the gateway 22. In the gateway 22, a signaling channel is established between end points 5 after receiving the permission check from the proxy gatekeeper 21 or the master gatekeeper 1, and the next procedure of H.323 is performed.
[0037] It becomes possible to process many gateways from the number of the gateways which were able to be processed by one gatekeeper thereby conventionally.
[0038]
[Effect of the Invention] As explained above, since this invention processes the address translation demand of the gateway by the proxy gatekeeper inside a gateway unit and mitigates a master gatekeeper's load, it becomes possible [processing many gateways] from the number of the gateways which were able to be conventionally processed by one gatekeeper. It becomes unnecessary consequently, to raise a gatekeeper's throughput or to add a gatekeeper as the number of the gateways is increased.
[0039] Moreover, the processor-limited time of the gateway which needs only address translation can be shortened by processing the address translation demand of the gateway by the proxy gatekeeper inside a gateway unit.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In order to solve an above-mentioned technical problem, the gateway system of this invention is characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system which used H.323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.
[0008] By the above composition, the address translation demand of the gateway is processed by the proxy gatekeeper, and a master gatekeeper's load is mitigated.
[0009]
[Embodiments of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing.
[0010] ** [reference of drawing 1 / contain / the master gatekeeper 1, a gateway unit 2, and the network address & port number inverter 3 / the gestalt of this operation] The gateway unit 2 is equipped with the proxy gatekeeper 21 and the gateway 22. The zone 6 described by H.323 is constituted from a master gatekeeper 1 and a gateway unit 2, and the gatekeeper 4 of other zones 7 and communication with an end point 5 are performed via the network address & port number inverter 3.
[0011] As shown in drawing 2 , functional distribution of H.323 conventional gatekeeper's 8 function is carried out by the master gatekeeper 1 and the proxy gatekeeper 21. In the proxy gatekeeper 21, it has address translation function 21a and zone function manager 21b among the gateway control functions which H.323 gatekeeper 8 was processing conventionally, and the bottleneck by the access concentration from the gateway is canceled. The master gatekeeper 1 has recognition control function 1c, 1d of bandwidth-control functions, call control signaling function 1e, 1f of call license functions, 1g of bandwidth function managers, and 1h of call function managers other than address translation function 1a and zone function manager 1b.
[0012] The network address & port number inverter 3 has the function to change a network address and a port number, in case either communicates with other zones 7 among the master gatekeeper 1, the proxy gatekeeper 21, and the gateway 22. A port number is the address in a transport layer. From other gatekeepers 4 and end points 5 of a zone 7, the master gatekeeper 1 seems to be the gatekeeper of a zone 6 instead of the proxy gatekeeper 21 by changing the proxy gatekeeper's 21 network address and port number into the master gatekeeper's 1 network address and port number especially.
[0013] In addition to the conventional H.323 gateway function, the gateway 22 has the function to require anew the participating demand to the call by which participating refusal was carried out by the proxy gatekeeper 21 of the master gatekeeper 1.
[0014] Next, with reference to drawing 1 , drawing 3 , drawing 4 , and drawing 5 , operation of the gestalt of this operation is explained in detail.
[0015] In drawing 3 , when the gateway 22 sends to an end point 5, the participating demand A1 is transmitted to the proxy gatekeeper 21. In the proxy gatekeeper 21, the positional information demand A3 which changed the network address & port number of the proxy gatekeeper 21 in the positional information demand A2 into the master gatekeeper's 1 network address & port number when it went via the network address & port number inverter 3 the middle, although the positional information demand A2 was sent to the gatekeeper 4 of the other zones 7 is transmitted by the address translation function, and the positional information demand A3 is received in a gatekeeper 4.

[0016] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number of the master gatekeeper 1 in the positional information check A4 into the proxy gatekeeper's 21 network address & port number is transmitted, and positional information check A5 is received in the proxy gatekeeper 21. The proxy gatekeeper 21 will transmit the permission check A6 to the gateway 22, if the participating demand A1 is accepted. In the gateway 22, the signaling channel A7 is established to the transport address specified by the permission check A6.
[0017] When the participating demand B1 which, on the other hand, needs the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 4 is transmitted, participating refusal B6 is sent in the proxy gatekeeper 21. In addition, the procedure from positional information demand B-2 to positional information check B5 is the same as the procedure from the positional information demand A2 in drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the permission check B8 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.
[0018] Moreover, in drawing 5 , the case where a signaling channel is relayed by the master gatekeeper 1 is explained. This differs from the example of drawing 4 instead of the transport address for signaling of an end point 5 at the point which notifies the master gatekeeper's 1 transport address for signaling in the permission check C8 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel C9 of the gateway 22 and the master gatekeeper 1 and the signaling channel C10 of the master gatekeeper 1 and an end point 5 are established.
[0019] Next, operation of the gestalt of this operation is explained using an example. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 3 , the participating demand A1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the network address & port number inverter 3 which sends the positional information demand A2 and carries out a course the middle in the proxy gatekeeper 21 to the gatekeeper 4 who holds this alias address '012-345-6789' The positional information demand A3 which changed the network address & port number "10.7.8.9:5001" of the proxy gatekeeper 21 in the header of the positional information demand A2 into the master gatekeeper's 1 network address & port number "10.4.5.6:10001" It transmits and seems that the master gatekeeper 1 transmitted in a gatekeeper 4 at the time of positional information demand A3 reception.
[0020] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 '10.1.2.3:1720' to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number "10.4.5.6:10001" of the master gatekeeper 1 in the header of the positional information check A4 into the proxy gatekeeper's 21 network address & port number "10.7.8.9:5001" is transmitted, and positional information check A5 is received not by the master gatekeeper 1 but by the proxy gatekeeper 21. By the proxy gatekeeper 21, the transport address '10.1.2.3:1720' over an end point 5 is acquired by reception of positional information check A5. Then, the permission check A6 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel A7 is established to the specified transport address '10.1.2.3:1720'.
[0021] Moreover, by the proxy gatekeeper 21, in order that the gateway 22 may send to '012-345-6789' which is the alias address of an end point 5 in drawing 4 , when the participating demand B1 containing user authentication is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, participating refusal B6 is sent. In addition, the procedure from transmission of positional information demand B-2 to response reception of positional information check B5 is the same as the procedure of transmission of the positional information demand A2 of drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand B8 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0022] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 5 , the procedure from the participating demand C1 to the participating demand C7 is the same as the procedure from the participating demand B1 of drawing 4 to the participating demand B7. In the master gatekeeper 1, the permission check C8 which includes the transport address '10.4.5.6:1720' of master gatekeeper 1 self by the permission check C8 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel C9 is established to the specified transport address '10.4.5.6:1720'. Furthermore, the signaling channel C10 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel C9 and the signaling channel C10 turn into a signaling channel of the gateway 22 and an end point 5.
[0023] Next, the gestalt of other operations of this invention is explained in detail with reference to a drawing. The gestalt of operation of drawing 6 and drawing 7 differs from the example of drawing 3 - drawing 5 at the point by which the proxy gatekeeper 21 is seen from the other zones 7 with the gatekeeper of a zone 6 instead of the master gatekeeper 1.
[0024] In drawing 6 , when the gateway 22 sends to an end point 5, the participating demand D1 is transmitted to the proxy gatekeeper 21. At the proxy gatekeeper 21, by the address translation function, the positional information demand D2 is sent to the gatekeeper 4 of the other zones 7, and the transport address for signaling over an end point 5 is acquired by the response of the positional information check D3. The proxy gatekeeper 21 will transmit the permission check D4 to the gateway 22, if the participating demand D1 is accepted. In the gateway 22, the signaling channel D5 is established to the transport address specified by the permission check D4.
[0025] When the participating demand E1 which, on the other hand, requires the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 7 is transmitted, the participating refusal E4 is sent in the proxy gatekeeper 21. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.
[0026] Next, an example is explained. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 6 , the participating demand D1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand D2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check D3. Then, the permission check D4 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel D5 is established to the specified transport address '10.1.2.3:1720'.
[0027] Moreover, by the proxy gatekeeper 21, when the participating demand E1 whose gateway 22 contains user authentication in drawing 7 is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, the participating refusal E4 is sent. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.
[0028] Next, the gestalt of other operations is further explained in detail with reference to a drawing. Reference of drawing 8 of the gestalt of operation of drawing 8 , drawing 9 , and drawing 10 changes it with the example of drawing 6 and drawing 7 in that the proxy gatekeeper 21 has call control signaling function 21e in addition to address translation function 21a in the gestalt of operation shown in drawing 2 , and zone function manager 22B. It becomes possible not to establish the signaling channel between the gateway 22 and an end point 5 directly by that cause, as drawing 9 shows by judgment of the proxy gatekeeper 21, but to establish the signaling channel F5 of the gateway 22 and the proxy gatekeeper 21, and the signaling channel F6 of the proxy gatekeeper 21 and an end point 5.
[0029] Moreover, reference of drawing 10 changes the gestalt of this operation instead of the transport address for signaling of an end point 5 at the point which notified the master gatekeeper's 1 transport address for signaling in the permission check G6 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling

channel G7 of the gateway 22 and the master gatekeeper 1 and the signaling channel G8 of the master gatekeeper 1 and an end point 5 are established.

[0030] Whenever the signal transmitted and received on the signaling channel G8 passes the network address & port number inverter 3, the master gatekeeper's 1 network address, the network address of a port number and the proxy gatekeeper 21, and a port number are changed. Consequently, from an end point 5, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21.

[0031] Next, an example is explained. for example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 9 , the participating demand F1 to this alias address '012-345-6789' is transmitted from measure and the gateway 22 to the proxy gatekeeper 21 By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand F2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check F3. Then, the permission check F4 which includes a proxy gatekeeper's own transport address '10.4.5.6:1720' instead of the transport address over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel F5 is established to the specified transport address '10.4.5.6:1720'.

[0032] Furthermore, the signaling channel F6 is established from a proxy gatekeeper to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel F5 and the signaling channel F6 turn into a signaling channel of the gateway 22 and an end point 5.

[0033] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 10 , the procedure from the participating demand G1 to the participating demand G5 is the same as the procedure from the participating demand E1 of drawing 7 to the participating demand E5. In the master gatekeeper 1, the permission check G6 which includes the transport address '10.4.5.7:1720' of master gatekeeper 1 self by the permission check G6 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel G7 is established to the specified transport address '10.4.5.7:1720'. Furthermore, the signaling channel G8 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel G7 and the signaling channel G8 turn into a signaling channel of the gateway 22 and an end point 5.

[0034] Here, when the master gatekeeper's 1 network address and port number in the signal sent to an end point 5 from the master gatekeeper 1 relay the network address & port number inverter 3, they are changed into the proxy gatekeeper's 21 network address and port number. Conversely, when the proxy gatekeeper's 21 network address and port number in the signal sent to the master gatekeeper 1 from an end point 5 relay the network address & port number inverter 3, they are changed into the master gatekeeper's 1 network address and port number. Therefore, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21, when it sees from an end point 5.

[0035] Like, when [which was described above] the gateway 22 sends to an end point 5, the participating demand to H.323 communication is first given to the proxy gatekeeper 21. The proxy gatekeeper 21 searches for the arrival-of-the-mail place address of an end point 5 by the address translation function. And in accepting a participating demand, it notifies to a permission check at the gateway 22 including the arrival-of-the-mail place address. In not accepting a participating demand, it notifies the participating refusal including the arrival-of-the-mail place address to the gateway 22.

[0036] In the gateway 22, when participating refusal is carried out, the participating demand to H.323 communication is anew given to the master gatekeeper 1. The master gatekeeper 1 judges whether the participating demand of the gateway 22 is accepted, and notifies a permission check or participating refusal to the gateway 22. In the gateway 22, a signaling channel is established between end points 5 after receiving the permission check from the proxy gatekeeper 21 or the master gatekeeper 1, and the next procedure of H.323 is performed.

[0037] It becomes possible to process many gateways from the number of the gateways which were able to be processed by one gatekeeper thereby conventionally.

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3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the gateway structure-of-a-system view of this invention.
[Drawing 2] H. It is 323 gatekeepers' functional block diagram.
[Drawing 3] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 4] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 5] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 6] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 7] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 8] H. It is 323 gatekeepers' functional block diagram.
[Drawing 9] It is transceiver explanatory drawing between the gateway and an end point.
[Drawing 10] It is transceiver explanatory drawing between the gateway and an end point.
[Description of Notations]
1 Master Gatekeeper
2 Gateway Unit
3 Network Address & Port Number Inverter
4 Gatekeeper
5 End Point
6 H.323 Zone
7 Other Zones
21 Proxy Gatekeeper
22 Gateway

[Translation done.]

* NOTICES *

1. This document has been translated by computer.So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] H. Gateway system characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system using 323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.
[Claim 2] The gateway system according to claim 1 characterized by the aforementioned proxy gatekeeper having a call control signaling function.
[Claim 3] The gateway system according to claim 1 or 2 characterized by transmitting a participating demand to the aforementioned master gatekeeper when the aforementioned gateway receives participating refusal to transmission of the participating demand to the aforementioned proxy gatekeeper.
[Claim 4] The gateway system according to claim 1 to 3 characterized by holding a proxy gatekeeper and the gateway in the same equipment.
[Claim 5] The gateway system according to claim 1 to 4 characterized by having the network address & port number inverter which changes a network address and a port number in case either communicates with other zones among the aforementioned master gatekeeper, a proxy gatekeeper, and the gateway.
[Claim 6] The gateway system according to claim 5 by which the aforementioned network address & port number inverter is characterized by changing a master gatekeeper's network address, the network address of a port number and a proxy gatekeeper, and a port number in case the aforementioned master gatekeeper notifies a master gatekeeper's transport address for signaling to the aforementioned gateway and communicates with other zones.

[Translation done.]